

Applicant : Peter J. Burke et al.
Appl. No. : 10/789,779
Examiner : Arun S. Phasge
Docket No. : 703538.4036

Remarks

Claims 1-5, 7-23, 25-33, and 57 are pending in this application. Claims 1 and 20 have been amended and claims 6 and 24 have been cancelled in this Amendment.

Formalities

A. Claim Numbering

Applicants note that the original claimset numbering scheme had two claims numbered as “33”. Applicants have renumbered the second occurrence of “claim 33” as “claim 57”; otherwise, no changes to renumbered claim 57 have been made.

II. Rejections under 35 USC § 103

Claims 1-33 are rejected under 35 USC § 103 as being unpatentable over Kaler et al. (US 2003/0048619).

Amended claims 1 and 20 and their respective dependent claims are patentably distinguishable over the cited reference because claims 1 and 20 recite the use of nanoelectrodes for manipulating a polarizable object lying there between, which is *not disclosed* by the Kaler reference.

As disclosed in Kaler, and as is claimed in claims 1-12 of same, Kaler solely teaches the manufacture of *microwire* structures. *See* Par. 4 and 8. Indeed, the independent claims of Kaler both are written to capture the thrust of the purported innovation:

Claim 1 requires “a substrate; a pair of electrodes . . . ; an electric field . . . ; and an *electrically conductive microwire formed between said pair of electrodes . . .*”

Claim 7 requires “providing a substrate; providing a pair of electrodes . . . ; electrically coupling an electric field source . . . ; and forming *an electrically conductive microwire between the pair of electrodes . . .*”

Kaler is in stark contrast to the object of the present invention and a person of ordinary skill in the art would be unable to import the teachings of Kaler to

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Applicants' invention. First, amended claims 1 and 20 make clear that Applicants do not claim any formation of a microwire process that would extend between two electrodes. Applicants have disclosed a system for manipulating a polarizable object about a medium, e.g., water, without the need to fashion a "microwire" for said manipulation. The manipulating aspects of Applicants' invention is carried out by exerting a force on a dielectric particle subjected to a non-uniform electric field.

Thus, the cited reference does not disclose, nor suggest, the novel features of the inventions claimed in claims 1 and 20. Claims 2-5, 7-19, 21-23, 25-33, and 57 are all dependent from allowable independent claims 1 and 20—accordingly, all the dependent claims are equally in condition for allowance.

III. Rejections under 35 USC § 102(a)

Claims 1-33 are rejected under 35 USC § 102(a), as being anticipated by Burke, an article entitled, Nanodielectrophoresis: Electronic Nanotweezers ("Burke"). As the Examiner has noted, this article was authored by one of the inventors to this Application. The Burke reference, however, is incapable of anticipating Applicants' claimed invention since it formed the very basis of Applicants' provisional application (App. Serial No. 60/450,985, filed February 27, 2003) of which this Application claims priority. *See Cross-Reference to Related Applications.*

The provisional application explicitly stated that the Burke reference illustrated the present invention. *See* Par. 25 of Prov. Appl. ("The Present invention is further illustrated by Appendix A [Burke reference], which is incorporated herein by reference as if set out in its entirety.").

Therefore, Applicants respectfully request that the Examiner withdraw its rejection of Claims 1-33 based on Burke.

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IV. Rejections under 35 USC § 102(b)

Claims 1-33 are rejected under 35 USC § 102(b), as being anticipated by Hughes, an article entitled, AC Electrokinetics: applications of nanotechnology (“Hughes”). Claims 1 and 20 have been amended to more distinctly point out and claim what the Applicants regard as their invention, by adding an additional limitation—namely, that at least one nanoelectrode be cylindrically shaped.

“[A] claim is anticipated if each and every limitation is found either expressly or inherently in a single prior art reference.” *Celeritas Techs., Ltd. v. Rockwell Int’l. Corp.*, 150 F.3d 1354, 1361, 47 U.S.P.Q.2d 1516, 1522 (Fed. Cir. 1998). The standard for lack of novelty, that is, for “anticipation,” is one of strict identity. *Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 1296, 63 U.S.P.Q.2d 1597, 1600 (Fed. Cir. 2002). In the present Office Action, the Examiner’s rejection is based on the Hughes reference, which fails to show *all* of the elements of the claimed invention.

Specifically, the Hughes reference does not disclose nanoelectrodes electrically coupled to time-varying voltage sources. As shown in Hughes Fig. 1 and page 125, Hughes discloses a dipole arrangement wherein said dipoles carry preexisting charges (+/-). Applicants have made it clear—through claim language and the specification—that a voltage is necessarily coupled to the nanoelectrodes in order to initiate particle manipulation. *See, e.g.*, Applicants’ Figs. 1a (103, 104), 1b (103, 104, 120), 2d (103, 104).

Moreover, Hughes fails to disclose Applicants’ nanoelectrode construction. That is, Applicants’ innovation has been claimed as requiring at least one cylindrically shaped nanoelectrode. Nowhere in Hughes is such an arrangement disclosed. In fact, Hughes solely discloses the use and implementation of planar electrodes. For example, Hughes states: “[D]ielectrophoretic manipulation of particles is performed on planar electrode arrays. Such electrode arrays employ patterned electrodes fabricated of gold or a similar conductor deposited on glass or

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silicon.” *See* Hughes, p. 126. Further, all illustrative depictions in Hughes indicate that a cylindrical structure was not even considered. *See, e.g.*, Hughes Figs. 4, 5, and 7 (all the electrodes are on the same plane).

Therefore, amended claims 1 and 20 are patentably distinguish over the Hughes reference and are in condition for allowance. Claims 2-5, 7-19, 21-23, 25-33, and 57, either directly or indirectly, depend from allowable independent claims 1 and 20—accordingly, all the dependent claims are equally in condition for allowance.

V. Conclusion

Prompt and favorable action on the merits of the claims is earnestly solicited. Should the Examiner have any questions or comments, the undersigned can be reached at (949) 567-6700.

The Commissioner is authorized to charge any fee which may be required in connection with this Amendment to deposit account No. 15-0665.

Respectfully submitted,

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Dated: December 4, 2008

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